A Mud Brick House in Greensburg, KY Kentucky Historic Sites Survey GNG-83

Field Report, August 8, 2008

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This is a report of the findings of an examination of a house built of unfired earthen blocks, plastered on the interior and until recently, covered on the exterior with siding. The house is located in Greensburg, in Green County, Kentucky. Until recently, its unusual construction technique was unknown to anyone with the possible exception of some past residents and electrical contactors. The church next door recently purchased the property and elected to tear down the house. The details of the house's construction technique persuaded them to stop the demolition process to get an opinion on what it was that was being torn down.

The house's walls are blocks of mud mixed with straw and mortared in between layers (figure 10). Nothing like it has been previously documented in Kentucky to my knowledge. It is a small house of two rooms, about 18 x 32 feet, with a central chimney stack, fireplaces in both rooms, a door to each room on one façade, and a window to each room on the other. The loft space is not accessible. At some point in the history of the house, a porch and side addition was added on, nearly doubling the floor space – the additions were recently removed, although the foundation remains in place.

1 (photograph: Kim Henderson)

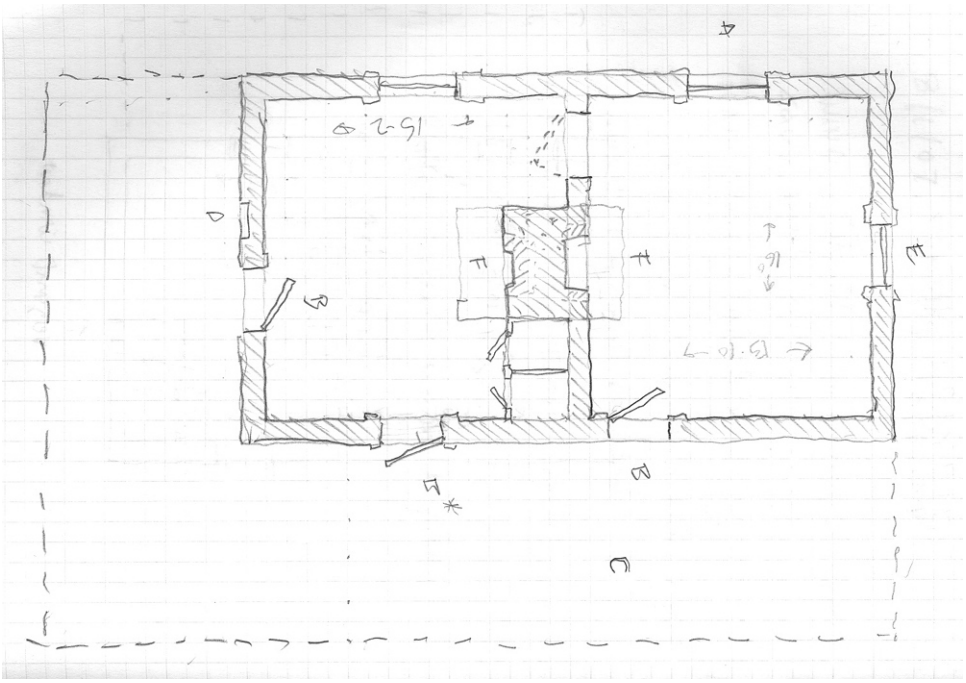
The foundation (visible in figure 6, below) has a bottom layer of roughly cut stone extending several inches above grade. On top of this foundation are two courses of fired brick, and then the unfired brick rests above that. After about 8-9 courses of mud brick, there is a thin layer of wood. These are repeated regularly up the wall. The wood layers were probably inserted to facilitate the leveling and plumbness of the walls as well as the attachment of interior trim. They later served as nailers for the attachment of exterior trim. Masonry construction is used for all the exterior walling and a part of the chimney stack and interior wall. The mortar appears to be almost like mud, but may be course lime putty. There are remnants of a smooth plaster finish on the exterior, which appears to have sloughed off: then the exterior was covered with circular sawn, cut-nailed board and batten siding. Other exterior trim included

bargeboard with sawn brackets, so the final result probably appeared as much Gothic/Victorian as it did Greek Revival.

The interior finish is of a high quality for a modest sized house, something we might call "cottage" architecture. Although the trim is not elaborate, the house has tall baseboards, paneled doors, well finished floors, and smooth plaster walls and ceilings. One room has a small closet beside the fireplace, which projects into the room, leaving a void where the closet is located. The trim in this room (figure 2) is plainer than that of the other room. The base boards have no top molding, and the door and window surrounds have no corner blocks. The closet, together with the lower level of finish, signals that this room is most likely an inner chamber, a bedroom. This room has two doors, one on the end of the house that swings inward, and one on the side of the house that appears to have always swung outward, as there are no visible hinge dadoes on the interior side of the jamb. This suggests either that there was a room on the other side of the door when the house was built, or possibly that it was hung that way so that it wouldn't swing into a bed or other large piece of furniture. In this field visit, it was not possible to examine the door from the other side due to demolition debris.

2. Interior of the bedroom. The outward swinging door is on the left.

The outer room (see floor plan, figure 3, and window, figure 4) has its fireplace flush with the wall, the baseboard has a molding at the top, and the door and window trim has corner blocks. This room also has windows on two sides. This was probably the more formal and more public outer room. Although we might call the house plan a "saddlebag" because of the shared central chimney and the similarity to the log house configuration of that name, or just a "double pen" because of the relative similarity of the room sizes, it is really functioning as a traditional hall/parlor house.



3 Floor plan of the house. The room on the left was a bedroom, the room on the right, the parlor. The extent of the additions is indicated by the dotted line. One square on the graph paper is roughly one square foot.

The windows are one of the remarkable features of the house – large, double hung sash windows with sills close to the floor (figure 4). There are 16/16 lights on the front windows and 12/12 on the single side window. They may have been salvaged from another house or production overrun from another project, as they would more normally be used for larger rooms with higher ceilings. The effect though, is quite wonderful – the small rooms are very well lit and have a sense of large scale they would not otherwise enjoy.

4. Window in the parlor.

This structure appears to be a unique or very unusual survival of mud brick construction in Kentucky, but the technique has a long history and is far more common in other parts of the country and the world. Using earth as a building material is about as ancient a practice as the first recorded construction of dwellings by humans, and examples can be found in nearly all regions of the world. It is best know in the United States in adobe construction, where plaster, whitewash, or stucco walls are exposed to the infrequent rains. There is another tradition of earth building that became somewhat popular in the Northeast in the 1840s and 50s, and has roots in the British and European practice of Cob building. "Cob" in this sense is defined in the Oxford English Dictionary as a "composition of clay (marl, or chalk), gravel, and straw, used, esp. in the south-west of England, for building walls, etc." Mud or clay was also used extensively in England, Europe, America, and to some degree in Kentucky to fill in spaces between wooden frames of some buildings, as with Old Mud Meeting House in Mercer County.

As Richard Pieper documents in his article "Earthen Architecture in the Northern United States" (available on-line at http://crm.cr.nps.gov/archive/22-6/22-06-7.pdf), period literature promoted the idea of earthen construction techniques, including rammed earth construction, where the material is tamped into molds, and "unburnt brick," the latter promoted by Henry Leavitt Ellsworth, the U.S. Commissioner of Patents in the 1840s, among others. In this period, articles on the technique can be found in agricultural and construction journals, as in the example from the Michigan Argus, May 5, 1847 found below in Appendix 1, which mentions the problem of plaster failure. The exterior plaster finish of the Greensburg example, as mentioned above, appears to have failed early on and been covered over with board and batten siding. This undoubtedly helped the building survive to the present day. We can surmise that other examples probably existed in the state at one time, and that perhaps other examples still do exist, but no others are now known.

5. Detail of one of the Mud Bricks. Note the presence of straw, which clearly shows the brick was not fired.

Although the exterior finish had some problems, the quality of the construction in this building appears to be quite high – there is remarkably little deterioration of the walls, and they are very straight. While we can only speculate at this time about who actually constructed this house, it appears to have been built skillfully. Building with earthen brick has its pitfalls, according to one recent commentator:

> Building a cob wall is far from straightforward. The flexibility of the material may have great creative potential but rookies are likely to suffer from shouldering (the width of the wall diminishing as it rises), mushrooming (the width increasing) and splooging (bulging and slumping because the wall has been built too fast). Constructing a house out of cob also requires specialist attention to all other building details including foundations, roofs, finishes and insulation.[1]

As the rest of the article points out, earthen architecture still has its adherents, and there is something of a revival going on in current promotions of more environmentally friendly construction. Although the technique did not have a significant impact on the Kentucky Landscape in terms of numbers, the existence

[1] Anderson, Will: "The Green House ; Mud Has Been Used For Thousands Of Years To Build Everything From Dwellings To Temples." The Independent. London (UK): Jul 12, 2006. pg. 4

of an example in the state does appear to be very significant as a reminder of a period that saw the rapid development of construction techniques such as balloon framing, the millwork production of prefabricated architectural components, and the production of wire nails. It is interesting that in the face of changes in the construction industry that rapidly moved further away from using construction materials obtained and manufactured on or near the construction site to those shipped in by railroad, that some were still promoting a technique that utilized on-site materials. At the time, though, it was not a foregone conclusion that most of our houses would eventually be built of materials shipped from far away. Given how successful the technique was in this case in making a sturdy and apparently comfortable house, it is somewhat surprising that it did not have a greater presence in the state.

6. Exterior of side window.

Saving the building would preserve an important example of architectural experimentation in the middle of the nineteenth century in Kentucky. More research needs to be done into who the owners and the builders were and where they came from. The mud brick house in Greensburg may have been inspired by an agricultural journal article, or it may be the work of someone such as a New York State immigrant to the area. Other unusual or one of a kind buildings have also been found in the state – a Pennsylvania German farmhouse in Bourbon County, a New England type vertical plank house in Nelson County, Old Mud Meeting house in Mercer County, or the buildings that the German immigrants constructed in Campbell County, are only a few examples. Taken together, they point to the diversity of people that the state attracted in the years of its settlement and expansion – the larger majority came from particular places, such as the Mid-Atlantic and Tidewater, and the Upland South, lending a uniformity to most of the building techniques and types we find, but others came in smaller numbers and left their stamp on the landscape as well. As the only know example of the unfired brick construction technique in the state at this time it is a very important document of a key period of the history of Greensburg, Green County, and the State of Kentucky.

Appendix One, from the Michigan Argus, May 5, 1847

UNBURNT BRICK HOUSES. -- These are constructed of bricks made of the same material as common bricks -- clay and sand -- but much larger. When the wall is designed to be a foot thick, the size is commonly 12 inches long, 6 inches wide, and 6 inches deep. Some prefer to have them 18 by 12, by 8. The materials should be well worked in the usual manner, and prairie hay or straw added, chopped into lengths of 6 or 8 inches. The shape for molds used in Chicago, is a box of the size of the brick -- the sides the longest way projecting at the end of it far enough to fasten a cross piece at each end to carry the box off to the yard by, to deposit the brick to dry. The bottom of the box slides in and out in an easy groove in the side pieces, and when the brick is laid upon the yard with the top side of the mold down, the bottom is drawn out, without disturbing the mold or the brick in it. When the bottom is removed, the mold is evenly raised leaving the brick on the ground in good shape to dry. The bottom of the box slides in and out in an easy groove in the side pieces, and when the brick is laid upon the yard with the top side of the mould down, the bottom is drawn out, without disturbing the mould or the brick in it. When the bottom is removed, the mould is evenly raised, leaving the brick on the ground in good shape to dry. The bricks will dry sufficiently in a day of good weather to handle, when they should be turned up on edge, and the day after, on end. The third day they may be packed in a pile, and covered with boards, to protect them from the rain. In ten or twelve days they will be dry enough to use.

The foundation of the building should be of stone and raised two feet above the surface of the ground, to prevent dampness from ascending to the walls above. In laying the brick, the same material out of which they were moulded, is used for morter [sic]. The partition walls are carried up at the same time with the outer wall, and are of the thickness of the brick, six inches. The roof should project over the sides of the house, from 2 to 2-1/2 feet, except of course those sides on which there is a porch. This is to defend the walls from vertical rains, before it is thoroughly dry. When a porch is to be attached to the wall, scantling should be laid into the outer face of the wall to fasten it to. The house should be built early in the season, to give time for the walls to dry thoroughly before October, when they should be plastered on the outside with such morter as is suitable for the first coat on the inside wall. Some builders put on two coats, others none at all, but it is considered advisable to plaster. After plastering the wall should be pebble-dashed. The inside is plastered like that of any other house, but no lathing is required on either surface.

The advantages claimed for this kind of houses are:

1. Cheapness. The cost of erecting the walls being only 5 or 6 cents the cubic foot, exclusive of plastering, which cost on both sides between 2 and 3 cents more, for a wall a foot thick, making the entire cost of the finished wall, 8 cents a foot.

2. Comfort. These houses are cooler in summer, and warmer in winter, than any other house, unburnt brick being a non-conductor of heat. All the walls being solid, too, there is no harbor for mice, or other vermin, and they are very dry.

3. Neatness and durability. When well made, they are said to look remarkably well, and to stand for centuries.

The objections made to them are:

That the plaster has, in some cases, not adhered well. This is accounted for from its having

been put on before the walls were dry, and sometimes from there having an excess of lime in it.

Some walls have had so little hardness that rats have burrowed in them. The bricks, in such instances, were composed of bad materials, or were not well tempered. There could be no danger of this after the walls are well plastered.

The instances of failure which have occurred are thought to have been owing to the mismanagement of the builder. --- Certain it is, there have been many instances of complete success. This style of building, however, is better adapted to cottages for [of] one story, or a story and a half, than to houses of greater elevation.

(Source: http://washtenawhistory.org/index.php?section=home&content=stories&display=print#houses)